Influence of polymer type and structure on polymer modified asphalt concrete mix

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Abstract: Two low-density polyethylene (LDPE) resins and two ethyl vinyl acetate (EVA) polymers were used to modify asphalt binder, and then mixed with asphalt concrete according to Marshall Method of mix design (ASTM D 1559). Effect of weight average molecular weight (MW) of LDPE and vinyl acetate (VA) content of EVA was studied by performing Marshall Stability, moisture susceptibility (AASHTO T 283-89), resilient modulus (MR) and permanent deformation (rutting) tests. EVA with low VA content showed lower stability loss in Marshall Stability test and improved resistance in moisture susceptibility test in comparison to hot mix asphalt concrete mix (HMA) and other polymer modified asphalt concrete mixes (PMAMs). Higher MR and better rutting resistance were observed for PMAMs than that of HMA. This elastic behaviour of modified asphalt correlates very well with the M R and rutting resistance properties of PMAM.